

## DEDICATION

### DANIEL J. CRAWFORD

The California Botanical Society dedicates this volume of *Madroño* to Daniel J. Crawford, who is renowned not only for his studies of *Coreopsis* in California, western North America, Mexico and elsewhere, but also is acclaimed highly as a pioneering molecular plant systematist and an influential botanical role model.

Dan was born in Columbus Junction, Iowa in 1942 and spent his early life on a farm where he was intrigued by the interesting assortment of roadside and agricultural weeds growing in the vicinity of his rural home. A devoted Hawkeye, he formalized his botanical training by pursuing three successive degrees at the University of Iowa. He received a B.A. degree in General Science in 1964 and in just two years, completed an impressive M.S. degree (1966) focusing on the Umbelliferae of Iowa. Dan continued his graduate studies under the supervision of Thomas E. Melchert and completed a Ph.D. degree in botany within three years (1969), a remarkable feat given that his dissertation involved a complex analysis of Mexican *Coreopsis*, which incorporated cytological, morphological and newly emerging 'chemosystematic' approaches.

Dan began his career in the right place at the right time. While at U. Iowa, he overlapped with David E. Giannasi who was studying the flavonoid systematics of the genus *Dahlia* and the two became lifelong friends, eventually co-authoring a number of important chemosystematic papers. Their advisor T. E. Melchert, a recent graduate of the University of Texas, had studied the cytology and chemosystematics of the composite genus *Thelesperma* under the supervision of noted synanthrologist Billie Lee Turner. Turner and his colleague Ralph E. Alston were well-known to Dan by the plethora of chemosystematic studies they published in such prestigious journals as *Nature*, *PNAS* and *Science*. In 1966 Melchert arranged for Dan to meet with Alston and Turner during a collecting trip to Mexico.

That meeting between the 24-year-old botanist from Iowa and the two researchers at Austin must have been remarkably inspiring. Motivated by his advisor who was grappling with the precise delimitation of various genera within the Coreopsidineae, Dan found himself in the midst of two legendary botanists whose cutting-edge molecular research provided a tantalizing solution to elusive systematic problems. Dan has pursued a molecular approach to his systematic research ever since. However, he never abandoned his Levis or casual observations of country roadside flowers, but simply added a lab coat and laboratory bench to his repertoire. Incidentally, the lab coat remained a hallmark throughout his career and as a student, I never saw him in the lab without it.

Dan's expertise immediately secured him a job as assistant professor at the University of Wyoming, Laramie in 1969. It was there that his prolific publication record began with his first paper appearing in 1969 on a new species of *Coreopsis* from Mexico; shortly afterward he published several additional papers from his dissertation, which dealt with the cytology, flavonoid chemistry

and morphology of Mexican *Coreopsis*. He quickly was promoted to Associate Professor (1973) and served as acting Head of the Department of Botany at Wyoming in 1974 and 1976.

While at Laramie, Dan was secretary of Phytochemical Section of the Botanical Society of America (1975–1976) and a member of the education committee (1978). He also began a systematic study of *Chenopodium*, publishing more than a half dozen papers from 1973–1977 on the cytology, flavonoid chemistry, morphology and seed protein profiles for several species. Occasionally, a paper would appear on a group uncharacteristic of Dan's usual focus, such as his chemical and morphological studies of *Populus acuminatus* (1974) and *Arceuthobium* (1979). Such papers disclose Dan's keen scientific curiosity, which surely accounts for much of his success. His seed protein research logically led to allozyme analyses, which quickly propelled him to the forefront of research in plant evolutionary systematics where he rapidly gained recognition as a worldwide authority. Dan's first allozyme paper (on *Chenopodium*) appeared in 1977, co-authored by his post-doc Hugh Wilson.

By virtue of his novel and exceptionally perceptive work, Dan's rapidly escalating reputation resulted in an invitation to The Ohio State University as a Visiting Associate Professorship, for which he took a leave of absence from Wyoming during the 1977–1978 academic year. However, in 1977, the botanist from Columbus Junction moved to Columbus, Ohio to join the faculty of The Ohio State University permanently, where he advanced to full professor in 1980. Dan spent an ultra-productive 20 years at OSU before retiring in 2000.



At the Ohio State University, Dan joined forces with another B. L. Turner graduate and emerging Compositae researcher, Tod F. Stuessy. Dan and Tod went on to spearhead incredibly insightful research on the evolution of insular species by their collaborative work focusing on the flora of the Juan Fernandez Islands. The two continue to collaborate and their joint research has yielded dozens of articles encompassing nearly a thousand citations. This body of work has provided acute insight into the evolution of numerous genera on these islands. Dan's more recent work has involved the Canary Islands, where he has focused on *Tolpis* (Asteraceae) and the conservation of the flora.

Certainly one of the most amazing aspects of Dan's career has been his ability to keep pace with the newly emerging technical developments in plant systematics. He has established himself in every emerging field, transitioning smoothly from flavonoid chemosystematics to allozyme analyses, and ultimately to various macromolecular (DNA-based) approaches. As a result, Dan's work has included an impressive array of studies incorporating such diverse approaches as RFLP, DNA-sequencing, and RAPDs analyses. He is known for his many excellent review articles, which began in 1978 with "*Flavonoid chemistry and angiosperm evolution.*" In 1985 he wrote a review entitled "*Electrophoretic data and plant speciation*", which presented a comprehensive synthesis of allozyme data and their interpretation. The article literally has been cited a hundred times. Within five years he published the book: *Plant Molecular Systematics: Macromolecular approaches*, which was highly influential in that still developing field.

Although he has contributed a significant amount of taxonomic literature, Dan's true interests lie in the elucidation of plant speciation. Much of that interest derived from his studies in *Coreopsis* of closely related species pairs such as *C. basilis*/*C. wrightii*, *C. gigantea*/*C. maritima*, *C. nucensis*/*C. nucenoides* and varieties of *C. cyclocarpa*. Dan has been a strong proponent of plant evolutionary study and has done much to encourage others to pursue research in this area. In 2000, he wrote an article entitled: "*Plant Macromolecular Systematics in the Past 50 Years: One View*", which urged a more thorough study of "evolutionary processes and speciation" using DNA data.

Aside from *Coreopsis* and island plants, Dan has studied a wide variety of other species in conjunction with a broad list of collaborators including many of his students and post-docs encompassing an amazing assortment of genera including *Antennaria*, *Bidens*, *Calamagrostis*, *Calliopsis*, *Coreocarpus*, *Coreopsis*, *Lemna*, *Mabrya*, *Monarda*, *Paeonia*, *Polygonella*, *Sonchus*, *Tetramolopium*, *Trifolium*, *Vittadinia* and *Wolffiella* as some examples.

Dan has long been an advocate of collaborative research, believing that molecular studies are most meaningful when coupled with more "traditional" approaches, especially fieldwork. He has collected several thousand plant specimens during his career and the

accompanying photo (provided by T. F. Stuessy) should remind everyone that he is not simply a laboratory scientist by any means, despite the highly technical nature of his work. I think that this philosophy is one reason why he has been able to get along well with people working in just about any field of biology. He always has held a deep respect for the work that others have contributed to his own studies and he always has valued the incorporation of diverse data sources in his own research. Such is exemplified by his lengthy collaboration with G. J. Anderson (University of Connecticut), who provided the additional dimension of breeding system information to Dan's work on the evolution of island plants.

Dan's career has been studded with accolades, which include the presidencies of ASPT (1988) and Botanical Society of America (1996). In 1997 he was given the Asa Gray award, which represents the most prestigious honor bestowed by ASPT. Appropriately, he was presented the Alston Award for best phytochemical paper at the 1983 Botanical Society meetings. He received the BSA merit award in 1999 and a Centennial Award in 2006. His California connections include memberships in both the California Botanical Society and California Native Plant Society as well as service on the Editorial Board of Madroño from 1976–1981. After retiring from Ohio State, Dan secured an adjunct faculty position at the University of Kansas. He continues to be extraordinarily productive and currently is credited with two books and over 200 research articles. He also is involved with "PlantingScience.org", which helps high school students become familiar with science.

I remember vividly my arrival at The Ohio State University in 1980. When I first saw Dan milling about in his lab coat he terrified me. His research was spectacular and the intensely cerebral level of his graduate courses stunned me as well. In many ways I'm sure that I felt much like he did in 1966, awestruck by an encounter with one of the greatest personalities in all of systematic botany. However, I soon learned that behind the serious façade of a seasoned researcher was the soul of an absolutely wonderful person, unrivaled for his compassion, thoughtfulness and inspiration. He also liked professional wrestling! Dan's scholarship provided a contagious air of "friendly academic competition" among his grad students. By his example, we all worked feverishly on our projects, each one of us wanting to achieve the same level of success as scientists, and also hoping to gain his seal of approval. He was the very best advisor anyone could hope for. Billie Turner (now 87) recently conveyed to me these words: "Dan has always been one of my favorite academics and, what else, human being. A fine example for man kind." How can I say it any better?

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